Citation:

Dharod JM, Perez-Escamilla R, Bermudez-Millan A, Segura-Perez S, Damio G. Influence of the Fight BAC! food safety campaign on an urban Latino population in Connecticut. *J Nutr Educ Behav.* May-Jun 2004; 36 (3): 128-132.

PubMed ID: 15202988

Study Design:

Trend study.

Class:

D - Click here for explanation of classification scheme.

Research Design and Implementation Rating:

POSITIVE: See Research Design and Implementation Criteria Checklist below.

Research Purpose:

To assess the coverage and consumer satisfaction with the Fight BAC! campaign and to evaluate the influence of the campaign on food safety knowledge, attitudes and behaviors among a predominantly Latino population living in inner-city Hartford, Connecticut.

Inclusion Criteria:

- Respondents from Latino households
- Household had to have at least one child 12 years old or under
- Households were located in five predominantly Latino neighborhoods in inner-city Hartford, Connecticut (based on US Census data, at least half of its residents identified themselves as Latino).

Exclusion Criteria:

- Living outside the five predominantly Latino neighborhoods in inner-city Hartford, Connecticut
- Had no children or all children older than 12 years old
- Not from Latino households.

Description of Study Protocol:

Recruitment

- Neighborhoods were selected based on US Census data, where at least half of its residents identified themselves as Latino
- Sample quotas per neighborhood were proportional to the neighborhood's number of

residents
- Recruitment facilitated by partnership with local Latin agency
- Study approved by Human Subjects Review Committees of the University of Connecticut and the Hispanic Health Council.

Design

- Trend study
- Cross-sectional household surveys conducted before and after population exposure to Fight BAC! marketing campaign
- Surveys conducted in participant's language of choice by bilingual and bicultural interviewers
- Survey lasted 30 to 45 minutes and after completion, subject received shopping bag with logo and sanitation supplies, a meat thermometer and food safety materials
- Survey instruments included a food safety module with questions to assess socioeconomic and demographic characteristics
- Post-survey included section on exposure (aided recall), level of understanding and consumer satisfaction with campaign media channels
- Food safety module included 30 multiple-choice questions on food safety, knowledge, attitude and behaviors.

Intervention

- Exposure to Fight BAC! media campaign tailored to specific Latin communities for six months
- Media campaign included airing of 245 30-second Fight BAC! TV PSAs and 240 60-second Fight BAC! radio PSAs; it also included 15 Fight BAC! advertisements in local Spanish newspaper
- Materials distributed through community agencies, food pantries, hospitals, health fairs, schools, restaurants and day care centers
- Materials included plastic bags with logo, coloring books, stickers and brochures in English and Spanish.

Statistical Analysis

- Categorical variables with more than two categories were recoded into two categories to identify the association between food safety and sociodemographic variables
- Internal consistency of the food safety scale was first tested using the Cronbach α analysis
- Varimax rotation with Kaiser normalization test was used to determine principal components
- The evaluation of the campaign was carried out by using frequencies and cross-tabulations
- Multivariate logistic regression was conducted to determine the independent influence of the campaign on food safety knowledge level
- Statistical analyses performed using SPSS Inc., version 10.0, Chicago, Ill, 1999.

Data Collection Summary:

Timing of Measurements

- Pre-survey was collected from November 1999 to February 2000

- Post-survey was collected from July to October 2000.

Dependent Variables

- Food safety knowledge level and score
- Food safety attitudes
- Food safety behaviors
- Consumer satisfaction with campaign
- Level of understanding of campaign.

Independent Variables

Level of exposure (aided recall) to Fight BAC! food safety campaign (media and materials).

Control Variables

- Respondent's age
- Respondents's education
- Car availability
- Language spoken at home
- Respondent's employment status.

Description of Actual Data Sample:

- *Initial N:* 500 subjects
    - Pre-survey: 250 (92% females, 8% males)
    - Post-survey: 250 (97% females, 3% males)
- *Attrition (final N):* None reported
- *Age:* Collected, but not reported
- *Ethnicity:* Hispanic or Puerto Rican (94%)
- *Other relevant demographics:*
    - There was a disproportionate number of females over males
        - Pre-survey: 92% females, 8% males
        - Post-survey: 97% females, 3% males
    - Most subjects (pre-survey: 62%; post-survey: 64%, P=0.932) had less than high school education
    - 34% or subjects were employed
    - Few subjects had a dishwasher
        - Pre-survey: 8%
        - Post-survey: 7%
        - P=0.599
    - Monthly income (P=0.851):
        - $500 or less (pre-survey, 20%; post-survey, 22%)
        - $501 to $1,000 (pre-survey, 34%; post-survey, 34%)
        - $1,001 to $1,500 (pre-survey, 14%; post-survey, 18%)
        - $1,501 to $2,000 (pre-survey, 7%; post-survey, 6%)

- More than $2,000 (pre-survey, 3%; post-survey, 2%)
- *Location:* Inner city Hartford, Connecticut, US.

Summary of Results:

Pre- and Post-campaign Comparisons on Food Safety Awareness, Knowledge and Behavioral Practices Among Puerto Rican Community

Food Safety Outcome	% in Pre-survey (N=250)	% in Post-survey (N=250)	P-value
Awareness			
Saw the Fight BAC !® logo	10	42	0.000
Knowledge			
Aware of "cross-contamination"	28	33	0.218
Cutting vegetables on an unclean surface previously used to cut raw chicken	73	80	0.338
Aware of "bacteria"	87	86	0.597
Aware of "microbes"	80	85	0.156
Practices			
Washing hands with soap or disinfectant before cooking	94	99	0.004
Washing food preparation area with soap or disinfectant	93	95	0.371
Cleaning cutting board before placing food on it	98	98	0.797
Using thermometer when cooking hamburger	2	<1	0.411
Defrosting meat in refrigerator	7	14	0.010
Using the same knife to cut meat and vegetables when preparing meal	43	41	0.612
Using the same plate to place meats before and after cooking	10	10	0.880
Storing eggs at room temperature	1	1	0.549
Eating hamburgers when the meat inside is still pink	3	2	0.213

Primary Findings

Food safety behaviors:

- No major differences were found in food safety behaviors among the three groups, representing three different degrees of exposure to the campaign
- Pre- and post-survey comparisons showed improvements in proper hand washing and meat defrosting technique (P=0.010), with very low numbers defrosting meat in a refrigerator after campaign (14% post-survey)
- Few reported storing eggs at room temperature (Pre-survey, 1%; post-survey: 1%; P=0.549) and eating pink hamburgers (pre-survey, 3%; post-survey 2%; P=0.213)
- Most reported washing the food preparation area with soap or disinfectant (pre-survey, 93%; post-survey, 95%, P=0.371)
- Most reported cleaning cutting boards before placing food on them (pre-survey, 98%; post-survey, 98%; P=0.797)
- Almost half reported using the same knife to cut meat and vegetables when preparing meal (pre-survey, 43%; post-survey, 41%; P=0.612) but few reported using the same plate to place meats before and after cooking (pre-survey, 10%; post-survey, 10%; P=0.880)
- Almost all reported washing hands with soap or disinfectant before cooking (pre-survey, 1%; post-survey, 1%; P=0.549)
- The use of meat thermometers was very rare both before (2%) and after campaign (less than 1%) (P=0.411)
- Regarding meat defrosting, 20% answered correctly of those with two or more exposures, 11% of those with one exposure, 6% of the non-exposed (P=0.029).

Other Findings

Food safety knowledge:

- No between-survey significant differences with the terms, "cross-contamination" or "bacteria"
- After adjustment, subjects exposed to the campaign were 3.5 times more likely to have "adequate" food safety knowledge scores (score of two or more) than unexposed (OR=3.54; 95% CI 1.74 to 7.18; P<0.001)
- Subjects exposed to two or more campaign items were more aware of the term “cross-contamination” (41% among those with two or more exposures, 35% among those with one exposure and 17% among those not exposed; P<0.001)
- Subjects exposed to two or more campaign items were able to recognize the Fight BAC! logo (58% vs. 39% vs. 17%, respectively; P<0.001).

Author Conclusion:

- Social marketing campaigns that take advantage of multiple culturally-relevant media channels are likely to improve food safety awareness and bring about changes in food safety knowledge and attitudes among Latino consumers

- Campaign led to improvements in food safety awareness and knowledge, but not to major behavioral changes
- Need for more research among Latino people to better understand how to increase their familiarity with and adoption of Fight BAC.

Reviewer Comments:

- *Authors mentioned participant ages in the discussion, but did not report either collecting this variable or using it in multivariate analysis. This is important as age is a significant determinant of risky eating behavior*
- *Authors note as a limitation: No control group in pre-survey or post-survey design; thus, it cannot be ruled out that part of findings could be explained by parallel food safety promotion efforts aimed at our target community*
- *Quality Rating Checklist-related comments:*
  - *4.1: Methods of handling withdrawals were not described. Authors mentioned have partnered with Latin Agency for recruitment. Authors did not report the rate of response to recruitment advertisements and the rate of withdrawals during face-to-face surveys*
  - *7.6: Authors note as a limitation that self-reported behaviors were not observed behaviors; thus, they cannot rule our social desirability bias*
  - *8.7: There were multiple non-significant findings that could be explained by the apparently high variability of the data. No power calculation was described.*

Research Design and Implementation Criteria Checklist: Primary Research

Relevance Questions		
1.	Would implementing the studied intervention or procedure (if found successful) result in improved outcomes for the patients/clients/population group? (Not Applicable for some epidemiological studies)	N/A
2.	Did the authors study an outcome (dependent variable) or topic that the patients/clients/population group would care about?	Yes
3.	Is the focus of the intervention or procedure (independent variable) or topic of study a common issue of concern to nutrition or dietetics practice?	Yes
4.	Is the intervention or procedure feasible? (NA for some epidemiological studies)	N/A

Validity Questions		
1.	**Was the research question clearly stated?**	Yes
1.1.	Was (were) the specific intervention(s) or procedure(s) [independent variable(s)] identified?	Yes

1.2.	Was (were) the outcome(s) [dependent variable(s)] clearly indicated?	Yes
1.3.	Were the target population and setting specified?	Yes
2.	**Was the selection of study subjects/patients free from bias?**	Yes
2.1.	Were inclusion/exclusion criteria specified (e.g., risk, point in disease progression, diagnostic or prognosis criteria), and with sufficient detail and without omitting criteria critical to the study?	Yes
2.2.	Were criteria applied equally to all study groups?	N/A
2.3.	Were health, demographics, and other characteristics of subjects described?	Yes
2.4.	Were the subjects/patients a representative sample of the relevant population?	Yes
3.	**Were study groups comparable?**	N/A
3.1.	Was the method of assigning subjects/patients to groups described and unbiased? (Method of randomization identified if RCT)	N/A
3.2.	Were distribution of disease status, prognostic factors, and other factors (e.g., demographics) similar across study groups at baseline?	N/A
3.3.	Were concurrent controls used? (Concurrent preferred over historical controls.)	N/A
3.4.	If cohort study or cross-sectional study, were groups comparable on important confounding factors and/or were preexisting differences accounted for by using appropriate adjustments in statistical analysis?	N/A
3.5.	If case control or cross-sectional study, were potential confounding factors comparable for cases and controls? (If case series or trial with subjects serving as own control, this criterion is not applicable. Criterion may not be applicable in some cross-sectional studies.)	N/A
3.6.	If diagnostic test, was there an independent blind comparison with an appropriate reference standard (e.g., "gold standard")?	N/A
4.	**Was method of handling withdrawals described?**	No
4.1.	Were follow-up methods described and the same for all groups?	N/A
4.2.	Was the number, characteristics of withdrawals (i.e., dropouts, lost to follow up, attrition rate) and/or response rate (cross-sectional studies) described for each group? (Follow up goal for a strong study is 80%.)	No
4.3.	Were all enrolled subjects/patients (in the original sample) accounted for?	N/A
4.4.	Were reasons for withdrawals similar across groups?	N/A

4.5.	If diagnostic test, was decision to perform reference test not dependent on results of test under study?	N/A
5.	**Was blinding used to prevent introduction of bias?**	N/A
5.1.	In intervention study, were subjects, clinicians/practitioners, and investigators blinded to treatment group, as appropriate?	N/A
5.2.	Were data collectors blinded for outcomes assessment? (If outcome is measured using an objective test, such as a lab value, this criterion is assumed to be met.)	N/A
5.3.	In cohort study or cross-sectional study, were measurements of outcomes and risk factors blinded?	N/A
5.4.	In case control study, was case definition explicit and case ascertainment not influenced by exposure status?	N/A
5.5.	In diagnostic study, were test results blinded to patient history and other test results?	N/A
6.	**Were intervention/therapeutic regimens/exposure factor or procedure and any comparison(s) described in detail? Were interveningfactors described?**	Yes
6.1.	In RCT or other intervention trial, were protocols described for all regimens studied?	N/A
6.2.	In observational study, were interventions, study settings, and clinicians/provider described?	N/A
6.3.	Was the intensity and duration of the intervention or exposure factor sufficient to produce a meaningful effect?	Yes
6.4.	Was the amount of exposure and, if relevant, subject/patient compliance measured?	Yes
6.5.	Were co-interventions (e.g., ancillary treatments, other therapies) described?	No
6.6.	Were extra or unplanned treatments described?	N/A
6.7.	Was the information for 6.4, 6.5, and 6.6 assessed the same way for all groups?	N/A
6.8.	In diagnostic study, were details of test administration and replication sufficient?	N/A
7.	**Were outcomes clearly defined and the measurements valid and reliable?**	Yes
7.1.	Were primary and secondary endpoints described and relevant to the question?	Yes
7.2.	Were nutrition measures appropriate to question and outcomes of concern?	Yes
7.3.	Was the period of follow-up long enough for important outcome(s) to occur?	N/A
7.4.	Were the observations and measurements based on standard, valid, and reliable data collection instruments/tests/procedures?	Yes

7.5.	Was the measurement of effect at an appropriate level of precision?	N/A
7.6.	Were other factors accounted for (measured) that could affect outcomes?	???
7.7.	Were the measurements conducted consistently across groups?	N/A
8.	**Was the statistical analysis appropriate for the study design and type of outcome indicators?**	Yes
8.1.	Were statistical analyses adequately described and the results reported appropriately?	Yes
8.2.	Were correct statistical tests used and assumptions of test not violated?	Yes
8.3.	Were statistics reported with levels of significance and/or confidence intervals?	Yes
8.4.	Was "intent to treat" analysis of outcomes done (and as appropriate, was there an analysis of outcomes for those maximally exposed or a dose-response analysis)?	N/A
8.5.	Were adequate adjustments made for effects of confounding factors that might have affected the outcomes (e.g., multivariate analyses)?	Yes
8.6.	Was clinical significance as well as statistical significance reported?	Yes
8.7.	If negative findings, was a power calculation reported to address type 2 error?	No
9.	**Are conclusions supported by results with biases and limitations taken into consideration?**	Yes
9.1.	Is there a discussion of findings?	Yes
9.2.	Are biases and study limitations identified and discussed?	Yes
10.	**Is bias due to study's funding or sponsorship unlikely?**	Yes
10.1.	Were sources of funding and investigators' affiliations described?	Yes
10.2.	Was the study free from apparent conflict of interest?	Yes